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DON'T SHAKE THE CHAUFFEUR'S HAND: TOWARD RELIABLE KNOWLEDGE ABOUT INDUSTRIAL LIFE

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DON'T SHAKE THE CHAUFFEUR'S HAND:
TOWARD RELIABLE KNOWLEDGE ABOUT INDUSTRIAL LIFE

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In January, 1969, two young North American sociologists stepped off a train in Birmingham, England, on their way to establish research entry into a large British manufacturing firm. They were met, as is the custom, by a uniformed chauffeur who was to take them to the company's head office. After first establishing proper identity, the chauffeur reached out his gloved hand in order to take the briefcase held by one of the researchers. Engaged in conversation and, for the moment, misinterpreting this gesture, the sociologist grabbed the chauffeur's hand and shook it. Considerable confusion followed this brief encounter and, in the end, the chauffeur refused to converse with either researcher.

Although not in any catastrophic sense, this minor incident did affect the research in which the two sociologists were engaged. In firms they had researched in Britain prior to this one, they had learned that the chauffeur could be an invaluable guide to the culture of the firm. Usually, he knew of the concerns of senior management and how they were likely to view the anticipated research, as well as how the research would be received by other subgroups within the plant. These important bits of information were lost to the researchers when one inadvertantly violated the chauffeur's expectations by shaking his gloved hand.

Encounters like this one are typically not discussed in industrial

research reports (dissertations excepted). But, the experiences of most industrial researchers are probably filled with similar examples of unanticipated factors arising to disrupt the planned sequence of their research. In fact, we are convinced that snags, difficulties, and obstacles are endemic to research in complex industrial settings. Furthermore, and in a more polemical vein, we suggest that the findings of single research studies consequently are uninterpretable; that reliable conclusions about industrial life will emerge only as the findings of numerous and independent researches are pooled.

Evaluating Industrial Research

It is a truism that normative standards govern research in all scientific fields. Criteria not only guide the design and conduct of research, but also its interpretation and evaluation. This point is well illustrated in the field of industrial research where a number of standard criteria are employed as "bench marks" to assess research. Included here would be criteria like theoretical significance, "validity" and "reliability" of measures, sample representativeness, and the appropriateness of analytic techniques for the data at hand.

Although a thorough evaluation of any research requires evidence on these and other criteria, it is a reasonable premise that "...if the sampling stability and bias of a finding are unknown or are known to be adverse, little else can be supported unambiguously. That is, estimation of random error and sampling bias is a necessary (but not sufficient) condition for adequate evaluation" (Finifter, 1972:115).

Unfortunately, sampling bias is more often than not unknown in industrial research. Irrespective of the attention devoted to sampling considerations during the design phase of industrial research, experience reveals that

industrial researchers typically encounter difficulties and problems in the course of securing their samples that introduce unknown, and hence unpredictable, sources of bias into their research.

Sampling Bias in Industrial Research

Prior to entering the field, industrial researchers like other social scientists face the decision of whom to study. Ideally, this means setting up a representative random sampling plan. However, in most industrial studies this ideal is compromised by concern over which firms, given time and money considerations, are most likely to be supportive of the anticipated research (Delany, 1960:449-51), and by difficulties actually encountered in securing both entree to selected firms and the cooperation of industrial workers (see, for example, Scott, 1969). The magnitude of these problems is clearly indicated by the fact that very few industrial studies exist that are based on random samples.

Our experiences in conducting an attitudinal survey of approximately 5300 British industrial workers are illustrative of the kinds of snags, difficulties, and obstacles that compromise the "best laid plans..." For example, at the outset of our research we had hoped to design our study in such a manner as to ensure that our findings would be representative of the experiences of all British workers. Initially, we envisioned a two-stage random sampling plan which was to involve sampling industrial organizations and then individuals within selected organizations. We realized quickly, however, that such a plan was impractical given our limited time and resources, and the reputedly high refusal rate of industrial organizations in Britain. Consequently, we were compelled to make an alternative sampling decision which involved establishing a list of industrial firms known to be supportive of social research and also who employed diverse groups of industrial workers.

Our plan simply was to select organizations purposively from this list to provide us with a large and heterogeneous sample in terms of selected study variables. Thus, we selected a total of twelve firms.

Immediately, it can be seen that we were compelled to confine our attention to a group of firms which could very probably jeopardize the generalizability of our findings, for it is likely that organization which have sponsored previous research are different in significant respects from those which are generally non-supportive. At any rate, it is very probable that individuals working in these organizations differ substantially from individuals in firms which have not sponsored previous research. Thus, even before entering the field, unknown sampling biases were introduced into our research.

Of course, our experiences in this respect are not unique. Similar problems have certainly been noted in the case of the Hawthorne studies where, over a period of at least eight years, investigators, first from the National Research Council and then from the Harvard Graduate School of Business Administration, measured the attitudes and behavior of industrial workers. Similar instances of a possible "Hawthorne effect" are noted throughout the literature. For example, the Harwood Manufacturing Company has been investigated by the Research Center for Group Dynamics during a period of over twenty years, as has the Detroit Edison Company been involved in a long-term research relationship with Floyd Mann and his colleagues at the Institute for Social Research. In England, possible sampling biases emanating from continuous investigation can be noted in the Glacier Project where the principal investigator, Elliot Jaques of the Tavistock Institute, has maintained research contact for almost twenty years.

A second source of unknown sampling bias is introduced into industrial

research in the process of securing permission from selected organizations to engage in research. For example, six of the twelve firms we approached refused us permission outright to undertake our research. Three of these firms had other research in progress, while the other three gave various reasons for their lack of support. For example, one engineering firm which was experiencing difficulties in management-shop floor communication was willing to let us undertake our research only on the condition that we conduct in-depth interviews of their shop floor workers. The net effect of these six refusals was that further biases were introduced into our research as a result of the strong values and predispositions of organizational 'gatekeepers.' Thus, our findings are not generalizable even to firms known to be supportive of social research. Again though, our experience in this regard is not unique, but illustrative of other industrial research in which problems of access have been encountered (Delany, 1960).

A third source of sampling bias is introduced in the process of getting industrial workers within selected firms to participate in one's research. Here also, our experiences are illustrative. Sixty-one percent of the 5,274 potential respondents participated in our survey by returning a completed questionnaire, with company response rates varying from 37% to 83%. A whole host of uncontrollable factors influenced these response rates. For example, during the time between one company's acceptance of our survey and the actual distribution of questionnaires, a works dispute reaching the national level occurred. At the time we arrived at the factory with our questionnaires, neither the personnel director nor the chief union officials were in the plant. They were in conference in another city. Unfortunately, these were the only people in addition to senior management who were knowledgeable of our research

and when it was to take place. Although we had agreed that they would advertise our research, understandably they had not, and a good part of our first day was spent in explaining who we were and why we were in the plant. On the second day, during the worst snow storm of the winter, management and union officials returned from their conference, whereupon the unions instituted an overtime ban, and we began distributing our questionnaires. On the following day, the unions were threatening to walk out and we were walking around the factory familiarizing ourselves with production technologies. Meanwhile, the snow was beginning to take its toll. As it accumulated, absenteeism of up to 25% occurred in some departments, and we began collecting our questionnaires. Needless to say, the urgency of our "scientific research" was not felt on the shop floor, or by management for that matter. The fact that we managed to obtain even a 37% response in this firm is, in retrospect, somewhat surprising.

Without belaboring the point, it should be clear that a multitude of uncontrollable, mundane factors such as the industrial relations environment and even the weather, can serve to influence to a great extent whether or not industrial researchers are blessed with high returns. More generally, industrial research is not undertaken in a vacuum, but in complex socio-cultural settings. One major consequence is that in deciding which firms to research, in gaining entree to these firms, and in getting industrial workers to participate, researchers typically encounter numerous unforeseen events which introduce unknown sampling biases into their research. However, we noted above that to the extent that a research includes such biases, its evaluation becomes problematic. The intrinsic nature of industrial research thus poses a frustrating problem for researchers concerned to generate reliable conclusions about industrial life.

The obvious question is, how do industrial researchers deal with this problem? Perhaps the most common "solution" adopted has been to use significance tests in the evaluation of industrial research findings. However, in that this solution assumes random sampling in its interpretation, it is probably the least adequate of all currently used strategies (see, Galtung, 1967:340-89; Morrison and Henkel, 1970). Consequently, in most cases, the researcher is faced with the fundamental problem of getting a grip on unknown and uncontrollable sampling bias in order to evaluate his findings.

Toward Reliable Knowledge About Industrial Life

Having reached this point, it should be clear that industrial researchers face a hoary problem in evaluating their research. However, this does not mean that their research is unimportant or that reliable conclusions about industrial life cannot be reached. Quite to the contrary, it simply means that the systemic qualities of research in complex socio-cultural systems preclude reaching reliable conclusions on the basis of the findings of any single study.

It has long been recognized by many social scientists that reliable conclusions about social life will emerge only as the findings of numerous and independent studies are accumulated. To quote Finifter (1972:120-21):

> "Ultimately, ...the most powerful and trustworthy response researchers have been able to muster to guard against the vagaries of chance and artifact is to cumulate evidence...
>
> If a result can be made to reappear on repeated, independent occasions, our basis for placing confidence in it broadens accordingly."

The reason for this is that, by pooling and analyzing the resulting distribution of findings from a large number of independent studies, the researcher can determine what effects, if any, unknown sampling biases have

had on researches in an area. If the distribution of pooled findings converges toward a limit, then this limit can be taken as the "true" result of researches in the area, and it reasonably can be concluded that sampling biases are random in their effects. Of course, if this distribution does not approach a limit, i.e., if it turns out to be flat, bi-modal, or multi-modal, then findings can be re-analyzed introducing controls for potentially important variations between studies.

One major constraint on this procedure is that it is necessary that a large number of separate studies be available in a given area. Fortunately for industrial researchers, this is the case. In libraries, research centers, and data banks around the world, large groups of separate researches are currently available on problems of importance to industrial social scientists, e.g., productivity, absenteeism, retention, job satisfaction, etc.

A second constraint is that industrial researchers concerned to pool findings on such topics will find little in the literature or in the past experiences of their colleagues to help them solve their specific problems. Although pooling is obviously an important task, we are only beginning to come to grips with the specific theoretical, pragmatic, and technical problems involved in cumulating research findings. In a companion paper (Taveggia, 1974), we address these problems and discuss how a cumulation was accomplished and to what effect for 74 separate studies concerned with the relative effectiveness of different methods of college teaching and 24 individual studies involving the relative effects of maternal employment on child development.

Perhaps the most fundamental constraint on pooling research findings is that this procedure does not solve the problems of researchers concerned to evaluate immediately their research findings. Instead, it requires researchers

to postpone evaluation until such time as their findings are pooled with the findings of numerous other researches. However, to the extent that our analysis of industrial research has been accurate one, it is clear that we may have no justifiable alternative.

We may conclude by stating briefly some of the implications of data cumulation should it become a widely accepted strategy in industrial research. First, the consequences for theory building are tremendous. Theoretical models based on substantial and exhaustive independent empirical bases will likely result in powerful explanatory tools, certainly more adequate than many of the competing post hoc theories currently in existence in industrial psychology and sociology, most of them based on the results of one or, at best, a few empirical studies. Second, the implications for research are also important in that the cumulative aspect of science will be given more emphasis. Whereas pioneering studies are essential to the growth of a discipline, cumulation is necessary for its consolidation and elaboration. Finally, the importance of data pooling for industrial research applications cannot be underestimated. This strategy will allow estimates of confidence to be made in the application of research findings with the result that much of the faddishness associated with industry could be eliminated. In short, the introduction of data pooling as a stage in the research process is absolutely essential if one of our goals as industrial researchers is to generate reliable and valid conclusions about industrial life.

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